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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/197,643	11/23/1998	NAOKI KUWATA	Q52377	1520

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EXAMINER
TRAN, NHAN T

ART UNIT	PAPER NUMBER
2615	

DATE MAILED: 03/11/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/197,643	KUWATA ET AL.	
	Examiner	Art Unit	
	Nhan T. Tran	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 December 2002* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8 and 12-14* is/are rejected.

7)☒ Claim(s) *9-11* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *16 December 2002* is: a)☒ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed on 12/16/2002 have been fully considered but they are not persuasive:

With respect to claim 1, on page 7 at the end of third paragraph, the Applicant asserts the Maenaka reference, "It fails to teach or suggest at a first step of detecting color blur pixels and then, doing image processing only on the detected color blur pixel and pixels in the predetermined range."

In response, Examiner respectfully disagrees with the Applicant. First, Maenaka does disclose the step of detecting color blur pixels (e.g., false color, hereafter referred as "false color"). As shown in fig. 9, col. 9, lines 33-54, Maenaka teaches that the specific pixel is detected as a false color pixel since the horizontal interpolation outputs the color component signals Rh = 0.067, Bh = 0.6 (an example of upper part of fig. 9(C), also refer to col. 7, lines 24-41 for the calculation of interpolation process). These color component signals have different values from the other signal components when the specific pixel (center pixel) and its neighbor pixels are exposed under "white incident light". In this case, all color signals R, G and B are expected to have the same color level (col. 9, lines 33-39) but the outputs of Rh and Bh as mentioned above definitely have different color levels. This means that the false color pixel has been detected during the interpolation process, and the false color pixel is represented with the

different values of Rh and Bh. Second, Maenaka also teaches the image processing unit to perform "image processing on pixels within a predetermined range having said detected color blur pixel as a reference pixel, so as to reduce a color blur." Referring back to fig. 9 of Maenaka reference, it is clear that the outputs of three color components Go, Ro and Bo all equal to 0.2, and "the color signal levels of specific pixel shown in fig. 9(B) are also "0.2" " (col. 9, lines 50-52), meaning that the image processing has been performed on the false color pixel and pixels in the predetermined range (i.e., 3x3) by the weighted addition using the weighting coefficients Kh and Kv in order for the false color to be replaced with a more uniform color (having color value of 0.2) in the that range. In general, Maenaka teaches the image processing as set forth in the independent claim 1. With regard to the limitation "image processing only the detected color blur pixel and pixels in the predetermined range", in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "doing image processing only on the detected color blur pixel and pixels in the predetermined range.") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Further, in the first paragraph of page 8, the Applicant asserts, "Maenaka does not teach or suggest performing image processing on data from another input device, for example, data from a digital still camera or a scanner" and "Maenaka fails to teach image data, which is an output from an input device."

In response, Examiner respectfully disagrees with the Applicant. The independent claim 1, as amended, recites the limitation of "an input device which generates the image data by obtaining image data by a single-plate solid image pickup device..." The input device is not claimed to be any specific device. Therefore, the claimed limitation is generally met by the CCD device (CCD 12) taught in Maenaka, which is presented as the input device which generates image data to the processing unit (58, 60, 72) (see fig. 1).

With respect to claim 6, at the end of the last paragraph of page 8, the Applicant states, "Maenaka fails to teach or suggest replacing the color difference components with a central value of color difference components as set forth in claim 6 and using a smoothing process for the color difference components as set forth in claim 6." In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., "replacing the color difference components with a central value of color difference components as set forth in claim 6") are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). The smoothing process is implied as shown in fig. 9(C), in which the result is "the false color signal is prevented from being produced and color repeatability does not become bad", meaning that the false color has been replaced with uniform color value (i.e., "0.2") in the predetermined range to output a smooth color repeatability. Based upon Maenaka's disclosure as discussed above, the claimed limitation in claim 6 is met.

With respect to claims 12, 13 & 14, the claimed limitations have been analyzed in the discussion with respect to claim 1 above.

With respect to claims 7 & 8, on page 11, the Applicant asserts, "Takizawa does not teach or suggest having detected blur pixels and using them for image processing as set forth in the independent claims 1 and 12-14."

In response, Examiner respectfully disagrees with the Applicant. Maekana teaches image processing utilizing the interpolation technique to detect and enhance blur color pixels. On the other hand, Takizawa also teaches image processing utilizing the interpolation technique to perform edge enhancement (col. 16, line 60 – col. 17, line 21). Both Maekana and Takizawa share the same technique for the purpose of improving image quality. Therefore, it would have led those skilled in the art to motivate to combine these teachings as a whole process for improving image quality since that is the desired solution of interpolation technique being used for.

With respect to claims 9 & 10, the Examiner found Applicant's arguments are persuasive. Therefore, rejection of claims 9 & 10 are withdrawn and objected as an allowable subject matter.

Claim Rejections - 35 USC § 102

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6, 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Maenaka et al. (US 5,552,827).

Regarding claim 1, Maenaka discloses an image processing apparatus (e.g., camera 10) performing image processing on image data consisting of dot-matrixed pixels, output from an input device (e.g., CCD 12) which generates the image data by obtaining image data by a single-plate solid image pickup device (e.g., also CCD 12) where a plurality of color filters of element color components are arranged in a mosaic in a nonuniform densities (see figs. 2-9; col. 3, lines 26-38) and supplementing the image data by calculation to change the nonuniform densities to uniform densities (e.g., "color repeatability does not become bad" wherein the uniform densities Ro, Go and Bo equal to "0.2" as shown in fig. 9; col. 2, lines 4-7), the apparatus comprising:

a color-bur pixel detection unit, which is known as a false color pixel detection circuits of combined interpolation and correlation circuits 58 and 60, detecting a color-blur pixel (a false

color pixel) in the image data (see figs. 2, 8 & 9; col. 2, lines 4-20; col. 4, lines 44-46; col. 9, lines 33-54);

an image processing unit (e.g., circuit blocks 46, 58, 60, 72 shown in fig. 2), performing image processing on pixels within a predetermined range (3x3) having the detected color-blur pixel as a reference pixel (the specific pixel), so as to reduce a color blur (see figs 8 & 9; col. 9, lines 25-54).

Regarding claim 2, Maenaka et al disclose that the color-blur pixel detection unit (the false color pixel detection circuits 58 and 60) detects the color-blur pixel based on change rate (i.e., absolute value of a difference between adjacent pixels) of element color intensity for a low-density color filter (i.e., R and B filter) as shown in fig. 9 for Rh = 0.067, Bh = 0.6, between closely adjacent pixels (see figs. 8 & 9; col. 8, lines 25-55 & col. 9, lines 33-54).

Regarding claim 3, the change rate of difference between a reference element color intensity and the element color intensity for a low-density color filter (e.g., R and B filter), between adjacent pixels, are detected by the color-blur pixel detection unit as shown in figs. 8 & 9, col. 8, lines 25-55 & col. 9, lines 330-54, in which Rh = 0.067, Bh = 0.6.

Regarding claim 4, Maenaka et al clearly disclose that if there are a plurality of low-density color filters, the color blur pixel detection unit detects the color blur pixel based on the change rate of difference between element color intensities for the low-density color filters (R and B filters) between adjacent pixels (see col. 13, lines 12-22).

Regarding claim 5, the claimed limitations are analyzed with respect to claims 3 & 4.

Regarding claim 6, Maenaka implicitly discloses that the image processing unit performs smoothing processing on color difference components by suggesting, "it's possible to prevent the false color signal from being produced" and "the color repeatability does not become bad" (col. 9, lines 31-32 and col. 2, lines 47-48). The color difference components are obtained by subtracting luminance components from element color components of the pixels within the predetermined range having the color blur (false color) pixel as the reference pixel. This function is suggested by "an absolute value of a difference between the signals..." (col. 8, lines 47-55) within the predetermine range of 3x3 (figs 8 & 9). The image processing unit would inherently return the smoothing process components to the initial element color components in order to properly function as disclosed camera system.

Regarding claim 12, the claimed limitations are accommodated with respect to claim 1, and in addition of:

a memory (e.g., 1H) in which the image data being stored (see col. 3, lines 61-63);

a color-blur pixel detection circuit accessing the memory, indicating by "outputs a digital signal by 1 H" (col. 3, line 63) and detecting a position of a color blur pixel based on the difference between a pixel of interest and its peripheral pixel while sequentially moving the pixel of the interest (see figs. 8 & 9; col. 8, lines 25-55, wherein the pixel of the interest muse be moved from one to another throughout the process);

a color-blur reduction processing circuit reading data (e.g., Sh, Sv) of pixels within a predetermined range having the pixel of interest, detected as the color blur pixel, as a reference pixel (col. 3, lines 64-66; col. 8, lines 46-55), then performing calculation to reduce a color blur, and updating data of the pixel of interest stored in the memory with calculated data (col. 9, lines 4-32).

Regarding claim 13, the claimed limitations are fully analyzed with respect to claim 1.

Regarding claim 14, a medium containing an image processing control program for an image processing apparatus performing image processing on image data consisting of dot-matrixed pixels is inherently included in Maenaka's image processing apparatus in order for the image processing apparatus to function as disclosed (see claims 1, 12 & 13 for the same limitations).

Claim Rejections - 35 USC § 103

3. Claims 7 & 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maenaka et al (US 5,552,827) in view of Takizawa et al (US 6,388,706).

Regarding claim 7, Maenaka does not explicitly disclose that the image processing unit performs edge enhancement processing. However, Takizawa et al expressly disclose an image processing apparatus containing an image processing unit CPU 11 (see fig. 1) that performs an

edge enhancement processing through an interpolation process (see fig. 2(A),(B) & 3; col. 17, lines 14-17).

It would enhance the image processing unit of Maenaka by enabling a function of edge enhancement disclosed by Takizawa et al because such the edge enhancement function results in excellent color reproduction and sharpness (Takizawa et al, col. 4, lines 30-31).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the image processing unit of Maenaka et al with the edge enhancement function disclosed by Takizawa et al to result in excellent color reproduction and sharpness.

Regarding claim 8, Takizawa et al show that the edge enhancement function of the image processing unit performs edge enhancement processing on pixels within a range (3x3, which is the same range for smoothing processing) subjected to the smoothing processing (see col. 14, lines 25-28).

Allowable Subject Matter

4. Claims 9-11 are objected to as being dependent upon a rejected base claim 1, but would be allowable if rewritten in independent form including all of the limitations of the base claim 1 and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter in claim 9:

Maenaka et al., Kido et al. and Takizawa et al fail to disclose or teach the limitations of "when said image processing unit performs the smoothing processing on the pixels within the predetermined range having said detected color blur pixel as the reference pixel, if the size of a processing object image is large, said image processing unit increases the image range subjected to the smoothing processing, while if the size of the image is small, said image processing unit reduces the range subjected to the smoothing processing."

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nhan T. Tran whose telephone number is (703) 605-4246. The examiner can normally be reached on Monday - Friday, 8:00am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew B Christensen can be reached on (703) 308-9644. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

NT.
March 10, 2003

NGOC-YEN VU
PRIMARY EXAMINER